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AIREM (AIR EFFECTIVENESS MEASUREMENT) PROGRAM PLAN FY  
84-88(U) ANTI-SUBMARINE WARFARE SYSTEMS PROJECT OFFICE  
WASHINGTON DC 04 AUG 83

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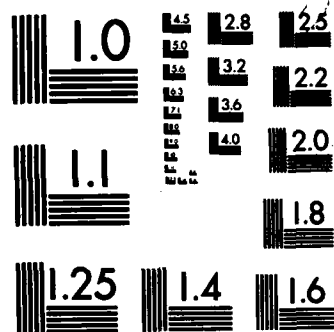
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ANTI-SUBMARINE WARFARE SYSTEMS PROJECT OFFICE  
WASHINGTON, D.C. 20362

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From: Manager, Anti-Submarine Warfare Systems Project  
To: Distribution List

Subj: Air Effectiveness Measurement (AIREM) Program

Encl: (1) AIREM Program Plan, FY 84-88

1. The annual AIREM Program Planning Conference was held on 21 and 22 June 1983. Representatives from PM-4 and Atlantic and Pacific fleet staffs formulated the basis for the AIREM Program for FY 84 and plans for FY 85-88.
2. Enclosure (1) is promulgated as guidance in the planning, execution, analysis and reporting of AIREM exercises during the next five fiscal years.

D. A. COX  
Deputy Manager

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# AIREM PROGRAM PLAN

FY 84-88



ENCLOSURE(1)

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## AIREM PROGRAM PLAN

### 1. BACKGROUND AND INTRODUCTION

The Air Effectiveness Measurement (AIREM) program originated in 1966 under the title of FIXMEX (Fixed Wing Evaluation Exercise) for the purpose of evaluating the effectiveness of fixed wing ASW aircraft in fleet operations. Rotary wing ASW aircraft were added as the program progressed. The data generated by these exercises have been the basis for determining airframe, weapon system and sub-system performance as well as overall air ASW effectiveness. The results of these analyses have been used extensively to identify and correct system and sensor deficiencies and to support system improvement.

In 1976 the CNO designated Manager, ASW Systems Project (MASWSP) as coordinating authority for the AIREM program and assigned foremost priority to evaluation of P-3 systems and sensors. Emphasis in 1977 was to evaluate S-3A ASW sub-system effectiveness. In response to issues raised by the Office of the Secretary of Defense, the HS community was tasked through AIREM to measure SH-3 performance and to develop a baseline of effectiveness during FY 78-79. For FY 80, continued close attention was given to collection of S-3A baseline data and evaluations were made of the improvements in the P-3C Update II and the SH-3H update, particularly the new SH-3 TACNAV system.

The AIREM program in 1980 commenced evaluation of the SH-2 as an air ASW platform in order to establish a baseline of performance measurements. This has been expanded under the aegis of AIREM to include the evaluation of the Light Airborne Multi-Purpose System (LAMPS), the combination of the ship and ASW helicopter. Efforts have continued into FY 82 to address LAMPS effectiveness not only in the AIREM program but also as a major participant in the Ship ASW Readiness Effectiveness (SHAREM) program.

For the other air ASW platforms, FY 81 and FY 82 exercises continued to concentrate on overall effectiveness measurements in terms of standard probabilities as well as the evaluation of individual sensors and their

contribution to mission success. Specifically, the SH-3 TACNAV and Sonar Data Computer (SDC), the S-3 Sonobuoy Reference System (SRS), P-3 DICASS and others were analyzed.

The AIREM program has concentrated on platform effectiveness usually in a scenario of single or multiple aircraft against a target submarine. While this has provided statistical support for various programs, there has been only a limited attempt to measure the effectiveness of air ASW forces in support of the battle group, the environment in which most platforms will operate. In 1982 the AIREM charter was expanded to include the effectiveness measurement of air ASW platforms in CVBG/convoy support, in the antisurface warfare (ASUW) mission, and in combined operation with the IUSS. The first CVBG ASW exercise in which AIREM resources participated was conducted in FY 82, and the second will take place in FY 83. The other missions will be included in FY 84/85 AIREM planning.

## 2. OBJECTIVES AND POLICY *(CHIEF of NAVAL operations)*

CNO letter serial 951C/348773 of 15 July 1982 reaffirms that *the* principal objectives of the AIREM program are to:

- a. *(1)* Measure the effectiveness of air ASW platforms in order to provide CNO *(OP-95)* accurate, current assessments of platform capabilities;
- b. *(2)* Identify and document deficiencies in current air ASW systems and sensors through collection of specific technical data,
- AND* c. *(3)* Recommend potential solutions and prioritization of weapon system improvement requirements.

The Manager, ASW Systems Project Office (PM-4) is the executive agent for CNO in the coordination of the AIREM Program and will:

- a. Develop and distribute a long range program plan formalizing program structure which includes funding requirements.
- b. Conduct the annual program review and concurrently specify the type, design, required analyses and priority of exercises to be conducted for the forthcoming program years.

- c. Ensure the publication of exercise reports, lessons learned and other reports based on analysis of exercise results.
- d. Provide funding for analytical and technical support to fleet units in accordance with the requirements as expressed in the approved AIREM Plan.
- e. Allocate sonobuoys and torpedoes for AIREM exercises.

Fleet Commanders are responsible for scheduling, conducting, analyzing and reporting exercises. Commands conducting AIREM exercises are requested to inform MASWSP of exercise dates and the extent of support required.

Policy guidelines for the AIREM program are set forth below; commands unable to comply should notify MASWSP prior to the exercise.

- a. Operational fleet aircraft manned by fleet crews and maintained by fleet personnel will be used.
- b. Trainers will be employed and pre-exercise modeling will be used to reduce repetitive errors, evaluate tactics and procedures, test and refine data collection and analysis procedures, and to provide training to operators, data collectors and operational staffs prior to the exercise.
- c. Team and operator performance levels will be objectively measured if practicable to ascertain crew readiness criteria and to award readiness qualifications as appropriate.
- d. Variables should be minimized during exercises to enhance confidence in the analysis. Frequent, small, carefully controlled exercises are preferred to ensure required data is obtained; however, exercises should be kept as realistic as possible recognizing those constraints. These guidelines pertain to platform and sensor evaluations, however, fleet operations offer the opportunity to collect data as in k, below.
- e. Quick Look reports will be prepared and issued within one month of the exercise and final reports not later than six months after completion of the exercise.
- f. Analysis Plans will be prepared prior to completing Exercise Plans to ensure exercises are structured to support the generation and collection of data needed to analyze the subjects of interest.
- g. The AIREM and TAC D&E programs may work closely together, coordinating exercises and analysis as desired.



- h. In general, the AIREM program will evaluate performance effectiveness of air ASW systems using established tactics for the specific scenarios encountered.
- i. Selected exercises will be done repeatedly--in several AIREM exercises if necessary--to develop an adequate sample.
- j. Draft final exercise reports will be reviewed by MASWSP for comment prior to distribution.
- k. Regularly scheduled fleet operations (READIEX, FLEETEX, BGAREM, COMPTUEX, RIMPAC, etc.) may be used to generate AIREM data whenever practicable. AIREM personnel may participate in the planning, execution, reconstruction, and analysis of these exercises and may generate AIREM reports of exercise results.

### 3. AREAS OF EFFORT

In order to achieve the program objectives as defined by CNO, the AIREM Program has been divided into the following sub-tasks:

- a. Platform effectiveness. Measure the performance of sensors and evaluate current ASW/ASUW Measures of Effectiveness (MOE) for each platform (P-3B/C, S-3A, SH-3H, SH-2F) utilizing among others, the following parameters.
  - (1) Probability of Detection
  - (2) Probability of Classification
  - (3) Probability of Localization
  - (4) Probability of Attack
  - (5) Probability of Reattack
- b. Equipment and operator deficiencies. Evaluate specific areas to document factors contributing to equipment or aircrew deficiencies; recommend corrective action alternatives.
- c. Improvement programs. Measure and evaluate changes in effectiveness as a result of new equipment, revised tactics or system improvements.
- d. Susceptibility to countermeasures. Measure and evaluate the impact of submarine countermeasures on both active and passive sensors.
- e. Training programs. Measure and evaluate the impact on aircrew effectiveness of existing ASW training programs.

- f. Data collection and analysis. Provide analytical support for all data acquisition, reconstruction, and analysis for the AIREM Program.
- g. Administration. Provide technical support, library management, exercise planning and range support.

#### 4. AIREM PROGRAM PRODUCTS

AIREM participants will prepare the following products:

- a. High quality operational data designed to support technical analysis of the performance of respective air ASW sensors and systems. Commands shall retain AIREM generated data for a minimum of 12 months after final exercise report promulgation.
- b. Data and analysis which document deficiencies in air ASW systems and sensors including the broad scope of aircrew performance.
- c. Evaluations of ASW coordination in combined exercises in order to improve close-in support to the battle group.
- d. Recommended alternative solutions for correction of deficiencies.
- e. AIREM reports as outlined in Appendix A. Distribution for these reports is also contained in Appendix A.

#### 5. FY-84 PROGRAM PLAN

- a. Tasks. During FY 84 the AIREM program will be in consonance with CNO guidance depending on asset availability. In general, assets will be distributed as evenly as possible among all four platforms. Continued overall measures of effectiveness will be added to platform baselines as well as evaluations of updates and modifications to platforms and sensors. Insofar as possible, all platforms should be utilized in ASW support missions and evaluated not only for effectiveness but also for utilization. The tasks for each air ASW platform are contained in Appendix B.
- b. Schedule. The exercise schedule is contained in Appendix C.

# APPENDIX A

TABLE 1  
AIREM REPORTS

<u>REPORT NAME</u>	<u>WHEN SENT</u>	<u>REMARKS</u>
Exercise Plans/LOIs	No later than one month prior to exercise	
Purples	Daily	Add PROJGR ASWS WASHINGTON DC as info addree.
Quick Look Report	Within one month of exercise completion	Best overview of exercise and results at that time. Distribution may be limited to PROJGR ASWS.
*Exercise Report	Within six months of exercise completion	Final report of exercise analysis of data, conclusions and lessons learned, and recommendations.
*Lessons Learned	As appropriate	Report summarizing and explaining lessons learned.
Expenditure Report	Within one month of exercise completion allocated assets.	Report expenditures of sonobuoys and torpedoes by type/quantity against AIREM allocations.

\* Originator forward these reports to Manager, ASW Systems Project Office two weeks prior to distribution to provide opportunity for comment.

# APPENDIX A

TABLE 2  
DISTRIBUTION LIST FOR AIREM DOCUMENTS

The commands listed below participate in or contribute to the AIREM Program. Minimum distribution of the AIREM generated reports listed in Table 1 will be in accordance with the notes keyed to specific commands and expanded as appropriate to include senior commands, participating activities and complementary commands on the opposite coast. Other air ASW activities should be included unless it is obvious that they would not be interested.

Notes: (1) Required distribution of all reports

(2) Required distribution of final reports

(3) Required distribution of all LOIs and Exercise Plans

(2)	CNO (OP-951, OP-506, OP-981)	DEFENSE TECHNICAL INFORMATION CENTER
(2)	NAVY TACTICAL SUPPORT ACTIVITY	COMNAVAIRDEVCE
(2)/(3)	CINCLANTFLT (NRT-1A, NRT-8, 35)	NAVAL OCEAN SYSTEMS COMMAND
(3)	COMSECONDFLT (N7, TAC D&E)	NAVAL UNDERSEA SYSTEMS CENTER
	COMNAVAIRLANT	(2) FASOTRAGRULANT
	COMSEABASEDASWINGSLANT	(2) COMNAVOCEANCOM
	COMAIRASWING ONE	
	COMHELASWING ONE	
	COMHELSEACONWING ONE	
	COMPATWINGSLANT	
	COMOPTEVFOR	
	CO AIRTEYRON ONE	
(3)	CINCPACFLT	
(3)	COMTHIRDFLT	
	COMNAVAIRPAC	
	COMASWINGPAC	
	COMPATWINGSPAC	
(1)	MANAGER ASW SYSTEMS PROJECT OFFICE	
	COMNAVAIRSYSCOM (PMA-244, PMA-264, PMA-266, AIR-5490, PMA-240)	
	COMNAVAIRTESTCEN	
	CENTER FOR NAVAL ANALYSES	

**APPENDIX B, TAB A**

**TASK 1: P-3B/C**

Battle Group exercise data from BGAREM 83-1 clearly supports the assessments of P-3 capabilities in the outer zone, particularly with respect to detection and classification. However, analysis of localization and attack data shows some weakness in the time to reach attack criteria and a general reluctance to use active sonobuoys. This is an area worthy of investigation within the context of the AIREM program. Additionally, continued emphasis will be placed on measuring the effectiveness of the P-3 in close support of the battle group while conducting coordinated operations with several different ASW platforms. Another AIREM exercise is planned for this purpose. With the addition of the ASUW and IUSS missions to the AIREM program, resources will be applied to assess fleet performance in these areas.

**Specifically AIREM will:**

- a. Measure P-3 effectiveness in localization and attack.
- b. Evaluate the P-3 in coordinated exercises with IUSS.
- c. Assess the P-3 in support of the CVBG.
- d. Evaluate the P-3 in the ASUW mission.
- e. Continue evaluation of VLAD sonobuoy procedures and tactics.

APPENDIX B, TAB B

TASK 2: S-3A

Results of FY 82 AIREM and BGAREM exercises show that the S-3A continues to improve in operational availability and on-station effectiveness. Two possible problem areas were identified during BGAREM: some crews experienced problems in the attack phase which may have been due to a lack of confidence in DICASS sonobuoys and an unfavorable MAD environment; and, GPDC failures had a significant impact on the ability of the S-3 to maintain contact.

During FY 84 AIREM and BGAREM exercises will attempt to increase the VLAD data base while providing aircrew training, presuming an increased availability of VLAD sonobuoys. Emphasis will be placed on coordinated operations with a combined VS/HS AIREM and a BGAREM scheduled. The new S-3A 4.0.3 software issue will be introduced to fleet squadrons this year; AIREM will evaluate the impact of this issue on on-station effectiveness.

Specifically, AIREM will:

- a. Measure overall system performance improvement/degradation to identify negative trends.
- b. Evaluate S-3 localization and attack procedures.
- c. Conduct coordinated S-3/H-3 operations.
- d. Evaluate the S-3 in support of the CVBG.
- e. Assess aircraft/crew effectiveness in the use of DICASS sonobuoys for weapons placement.
- f. Analyze S-3 effectiveness in weapon placement accuracy.
- g. Evaluate the impact of fleet issue 4.0.3 software on crew performance.

## **APPENDIX B, TAB C**

### **TASK 3: SH-3H**

The value of an ASW dipping sonar helicopter for close-in protection of the CV is continually under scrutiny, particularly as the SH-3 reaches the end of its service life. Therefore, the SH-3 in the CVBG support role will be a major effort during this coming year. The incorporation of an onboard acoustic processor expands the capabilities of the H-3 so evaluation of operator training is necessary as well as the tactical employment of sonobuoys in comparison to the dipping sonar. In conjunction with the S-3 program the SH-3 will be evaluated in coordinated operations with the S-3. As an adjunct to all exercises, the effectiveness of the SH-3 against submarine launched countermeasures will be assessed as feasible.

The AIREM program will:

- a. Measure crew effectiveness in the use of the SDC and the tactical application of sonobuoys with dipping sonar.
- b. Evaluate the effects of submarine countermeasures on SH-3 effectiveness.
- c. Continue SH-3 baseline effectiveness exercises.
- d. Evaluate the SH-3H in support of the CVBG.
- e. Conduct exercises to evaluate SH-3/S-3 combined operations.

**APPENDIX B, TAB D**  
**TASK 4: LAMPS MK-1**

Data on LAMPS performance is sparse, particularly the aircraft/ship interface. Emphasis will be placed on at sea exercises to collect data on response times, redetection probabilities and tactical employment of sensors. Misutilization of LAMPS is a continuing problem so other areas of evaluation will be the substantiation of LAMPS as a verification sensor and the use/misuse of LAMPS in search and detection. Also, the LAMPS will be a part of the CVBG support exercise scheduled for FY 84 and will be evaluated on performance during coordinated operations. The introduction of the LAMPS MK III will require determination of data collection methodology and analysis for this complex system as well as initial evaluations, if feasible. As a part of the expanded AIREM charter, the LAMPS OTH-T mission effectiveness will be assessed.

Specifically AIREM will:

- a. Evaluate LAMPS ASW full mission sequence effectiveness from datum to attack with emphasis on the ship/aircraft interface.
- b. Assess the ship/aircraft LAMPS system as a part of the CVBG ASW force.
- c. Determine LAMPS MK III evaluation parameters.
- d. Measure LAMPS MK I torpedo placement.
- e. Measure the effectiveness of LAMPS MK 1 working in conjunction with a HARPOON equipped surface unit to accurately target a hostile platform.
- f. Measure the effectiveness of LAMPS MK I targeting tactics with respect to targeting accuracy.



# APPENDIX C

## AIREM FY 84 EXERCISE SCHEDULE

<u>AIREM DESIGNATION</u>	<u>COMMAND</u>	<u>TASK</u>	<u>SERVICES REQUIRED</u>
<u>FIRST QUARTER</u>			
A	HSWING ONE	SH-3 BASELINE	AUTEC
B	PATWINGSLANT	P-3 VLAD	Open Ocean
C	VSWING ONE	Localization and Attack	AUTEC
D	VSWING ONE	Torpedo Placement	AUTEC
E	HELSEACONWING ONE	Full mission sequence	AUTEC
F	PATWINGSPAC	P-3 VLAD	Open Ocean
<u>SECOND QUARTER</u>			
Z	PATWINGSPAC ASWINGPAC	CVBG ASW Support (S-3/SH-3/SH-2/P-3)	PMRF
G	VSWING ONE	Coordinated S-3/SH-3 Ops	AUTEC
H	HSWING ONE	Coordinated SH-3/S-3 Ops	AUTEC
I	PATWINGSLANT	P-3 DICASS Countermeasures	AUTEC
<u>THIRD QUARTER</u>			
J	PATWINGSLANT	ASUM	Open Ocean
K	HELSEACONWING ONE	SH-2 Torpedo Placement	AUTEC

# APPENDIX C

## AIREM FY 84 EXERCISE SCHEDULE (Continued)

<u>AIREM DESIGNATION</u>	<u>COMMAND</u>	<u>TASK</u>	<u>SERVICES REQUIRED</u>
<u>THIRD QUARTER (Continued)</u>			
L	ASWINGPAC	SH-3 SDC Effectiveness	NAMOOSE
M	ASWINGPAC	LAMPS OTH-T/Multi-LAMPS Coordinated Tactics	PMTC/PMRF
N	PATWINGSPAC	P-3/IUSS Coordination	MIDPAC
<u>FOURTH QUARTER</u>			
O	ASWINGPAC	S-3 VLAD/DICASS/Passive to Active Conversion/Weapons Placement	PMRF
P	PATWINGSPAC	P-3 Tracking	WESTPAC
Q	VSWING ONE	S-3 Long range Detection and Localization	Open Ocean

# APPENDIX C

## AIREM LONG RANGE PLAN FY 85-88

<u>FY 85</u>	<u>VP</u>	<u>VS</u>	<u>HS</u>	<u>HSL</u>
1.	P-3C Update III	S-3 Baseline Effectiveness	SH-3 Baseline Effectiveness	LAMPS MK III Baseline Effectiveness
2.	ASUM	S-3 Localization	SH-3 SDC Effectiveness	LAMPS MK III SH-60 Subsystem
3.	PTA	S-3 Non-Acoustic Sensors	Countermeasures Effectiveness	LAMPS MK I Baseline Effectiveness
4.	New Sensors	CVBG Support	CVBG Support	LAMPS CZ Conversion
5.	CVBG Support			CVBG Support
<u>FY 86</u>				
1.	IUSS Coordination	S-3 Baseline	CVBG Support	MK III Baseline
2.	CVBG Support	ASUM	New Sensors	MK III Redetection
3.	ASUM	CVBG Support	Active Sonobuoy	MK I/III CVBG Support
4.	Acoustic Sensors	FLIR	Baseline Effectiveness	MK I AOP Conversion
5.	Non-Acoustic Sensors	New Sensors		

## APPENDIX C

### AIREM LONG RANGE PLAN FY 85-88 (Continued)

FY 87

It is anticipated that improvements in platforms, weapons and sensors will require continued testing. CVBG exercises will encompass more warfare areas, and ASW forces will be evaluated on the ability to meld into the multi-threat environment. The LAMPS MK III will be operating, and its effectiveness will have a direct impact on ASW readiness. Baseline measurements of all platforms will continue to be the basis of the AIREM program as a means of determining positive or negative trends in ASW performance.

FY 88

The ALWT will be introduced as well as the first improvements to the S-3A as it transitions to the S-3B. Other sensors will be introduced in both ASW and ASUM which will require evaluation.